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(54) Title: METHOD AND APPARATUS FOR PROVIDING CONTEXT SENSITIVE ADVERTISEMENTS TO MOBILE USERS

(57) Abstract: This invention provides a method and apparatus for providing context sensitive advertising material to mobile users. The mobile users may be using Internet devices and the context sensitive advertising material may be relevant to the users current location, current weather conditions and include explicit preferences set by the mobile user on the type of advertising material. Historical data on users preferences for a particular mobile carrier are recorded and a processor selects advertising material according to all these various conditions to provide a recommendation list of advertising to the mobile user.

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**METHOD AND APPARATUS FOR PROVIDING  
CONTEXT SENSITIVE ADVERTISEMENTS TO MOBILE USERS**

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**FIELD OF THE INVENTION**

This invention relates to a method and apparatus for providing context sensitive advertising material to mobile users.

**BACKGROUND TO THE INVENTION**

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There has been an increase in technology to mobilize communication equipment. This includes mobile telephones that have advanced from simple audio telephone networks to communication devices that can provide a variety of forms of communication such as short messages in addition to telephone conversation. More importantly, recent technology has mobilized the Internet market with more mobile Internet devices available that are able to provide information to the user in a variety of different formats.

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In general, advertisements to mobile users are provided across a broad band connection or similar so that all users received similar advertising material. To some extent, individual preferences may be found by the use of cookies or similar. These tend to be used by the Internet provider rather than a mobile carrier and do not take into account environmental or location characteristics of the mobile user. To the extent that advertising recommendations or selections may be provided by a third party, they are not generally tailored to these specific requirements of the individual mobile user and do not additionally utilize reference data available from usage by the group of users for that specific mobile carrier.

The result is that advertising is not particularly context sensitive and if provided, tends to be broadly targeted and mono in presentation.

The prior art solutions are generally not intelligent solutions to the provision  
5 of advertising. Even those that may provide some advertising based on an individual's previous activities through the use of cookies or similar, may not aggregate these activities to model the virtual persona of a mobile device user. Additionally, the prior art solutions do not seek to aggregate the personas of a plurality of users to deduce trends. As a result, such trends combined with an  
10 individual user's virtual persona are not catered for in selecting advertising.

These deficiencies in prior solutions generally lead to a lack of tailored marketing to mobile subscribers.

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#### OBJECT OF THE INVENTION

It is an object of the present invention to provide a method and apparatus that may alleviate some of the disadvantages of the prior art by providing a tailored advertising selection for a particular mobile user and for a particular subscriber location or at least provide the public with the useful choice.

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#### SUMMARY OF THE INVENTION

Accordingly, in a first aspect, the invention may broadly be said to consist in a method for selecting advertising for users of a mobile network having a plurality of users and at least one mobile carrier providing a communication path for said users  
25 comprising:

- providing at least one database of advertising for selection or recommendation;
- receiving and storing preferences for advertising from said mobile user;
- receiving information on at least said users location in said mobile network; and
- selecting or recommending advertising from said database in accordance with said preferences of said mobile user and said user location.

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Preferably said method also stores historical usage data of the collective and/or individual users of said mobile carrier and further processes said selection or recommendation in accordance with said historical usage data.

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Preferably said method selects advertising for a plurality of mobile subscribers.

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Preferably said method further includes the step of receiving and storing variable environmental data that may affect network users and further processing said selection or recommendation with reference to this environmental data.

Accordingly, in a second aspect, the invention may broadly be said to consist in an apparatus for selecting advertising for users of a mobile network having a plurality of users and at least one mobile carrier carrying a communication path for said users comprising:

- a first database containing advertising for selection or recommendation;
  - an explicit preference database to receive preferences for advertising from said mobile user;
  - 5 - receiving means to receive a request for advertising selection or recommendation for a user together with information on said user location; and
  - processing means to search said first database and compile selections or recommendations of advertising based on said explicit preferences and said user location.
- 10

Preferably said apparatus further includes an implicit preference database to contain and store historical usage data of the collective and/or individual use of the users of a mobile carrier and said processing means further processes said selection or  
15 recommendation with regard to this historical usage data.

Preferably said apparatus further receives environmental data on current environmental conditions that may affect said user and further processes said selection or recommendation to reflect these current environmental conditions.

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Accordingly, in a yet further aspect, the invention may broadly be said to consist in a method of providing context sensitive advertisements to mobile users over a network having a plurality of users and at least one mobile carrier comprising:

- receiving information on a user's location;
- 25 - receiving information on current environmental conditions;

- storing preferences specified by said mobile user; and
- interrogating a database of advertisements to provide a selection or recommendation based on said user's location, current environmental conditions and said mobile user's preferences.

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Accordingly, in a yet further aspect, the invention may broadly be said to consist in a communication system capable of providing context sensitive advertisements to mobile users comprising:

- a network containing a plurality of users and at least one mobile carrier communicating with said users on said network;
- a database of advertisements for recommendation or selection and provision to said mobile users; and
- processing means to interrogate said database to select or recommend advertisements for provision to said user on the basis of said user's location in the network, current environmental conditions and preferences specified by said mobile user.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention may now be described with reference to the following drawings in which:

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- Fig. 1 shows a diagrammatic view of the relationship between a mobile carrier, an implementation of the present invention and advertising aggregators;
- Fig. 2 shows a diagrammatic view of the relationship of components of a preferred embodiment of the invention;

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- Fig. 3 shows a schematic diagram of the architecture of a processor for implementing the present invention; and
- Fig. 4 shows a diagrammatic view of the flow of information amongst components of a preferred embodiment of the invention.

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### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

This invention relates to a method and apparatus for providing context sensitive advertisements to mobile users. The term "context sensitive advertisements" refers to advertisements where the content of the advertisement may only be applicable to mobile users in particular circumstances or at least may be more appropriate in particular circumstances. Although those circumstances can include a variety of conditions, location or current environmental conditions such as weather are examples where particular advertisements may have more relevance than others.

15 The reference to mobile users relates to users on a mobile network using any form of communication device. In general, the preferred embodiment may refer to users assuming they are using Internet devices. However, the technology may be equally applicable to other mobile devices including mobile telephones that can receive short messages or even audio advertising upon connecting to their service provider or being on hold for various reasons.

20 Although the format of the advertising material provided needs to reflect the particular type of device being used, a variety of formats may be used in conjunction with this invention.

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Referring to Fig. 1, the invention may be implemented in the form of a separate platform 1 immediate of the mobile carrier 2, the mobile carrier subscribers or users 3 and the supplier of advertising material such as a retail advertisement aggregator 4. The retail advertising aggregator 4 may themselves compile the advertisements from individual retailers or advertisers.

It will be appreciated that the structure shown in Fig. 1 is only one possible implementation of the platform 1. In other circumstances, the apparatus for providing context sensitive advertisements implemented on the platform 1 may be used directly by a mobile carrier 2 as part of their overall service. Similarly, the source of advertisements whether from a retail ad aggregator, individual retailers or sourced from the mobile carrier themselves if they already have existing advertisers is not essential to the present invention.

In general, the present invention provides a platform 1 to select and recommend particular advertisements from a variety of advertisements supplied and provide these to the mobile carrier 2 for transmission to the mobile user 3. The platform 1 seeks to select those advertisements to provide advertisements that are location and environmentally sensitive to the user 3.

Referring to Fig. 2, the components of the platform 1 are shown in more detail.



The processing of the method is performed by a central processing engine 15 as shown in Fig. 2. This processing engine 15 receives a variety of forms of information that are shown generally around the engine 15.

5       Of course, one of these items of information is a user request 17 from an individual end-user that passes through the network whether this be the Internet or other wireless or mobile network and to the processing engine 15. The processing engine 15 is receiving a variety of environmental data feeds such as natural environmental factors concerning the weather, time, date and matching these to the  
10       location of the user supplied with the user request 17.

Additional environmental data feeds may be supplied such as man-made factors being traffic status, various schedules or other features.

15       The engine 15 is also receiving profiles conforming to the explicit preferences of the mobile carrier and a variety of advertisements 14 for selection.

The engine 15 selects advertisements from those available in accordance with the explicit preferences of the mobile user and the various environmental factors and  
20       the user location to select advertisements and provide these as an output 20. This may be formatted appropriately for the user device and resupplied over network 19 and return to the individual end-users as a formatted context sensitive advertisement 16.

In addition to the selection criteria on environmental data feeds, user location  
25       and mobile user preferences, the platform 15 may also output statistical information

21 on the utilization of advertisements to provide some further historical data that may be utilized in subsequent selections or supplied to advertisers or the mobile carrier for their own information.

5           The engine 15 that provides the processing for the method and apparatus is shown in greater detail in Fig. 3.

As shown, the engine 15 comprises plurality of data stores, a data management manager, filters and a filter manager to assist in the selection processed.

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Looking at these specific items shown in Fig. 3, the processing is provided by the data manager 30 and the filter manager 31.

15           The data management manager is connected to a series of application services 32 to 36. These are the application services that provide a set of application programming interfaces to enable applications to access the underlining engine functionality.

20           The authentication and session management application 32 accepts authentication and session query request from users. It may identify the end-users identity and return authentication results to end-users. This service may respond to session queries and return the information to end-users.

25           A further application service being the data feed service 33 is provided. The data feed service may provide a plurality of services to load various environmental

data for handling by the data management manager and passage to the data stores discussed subsequently. The data feed service 33 may load natural environmental factors such as weather data that can be obtained on line from various data sources. Similarly, other available data such as traffic status can also be provided to the data  
5 management manager. This raw data is converted from the incoming data feed by the data feed service and supplied to the data manager in a suitable method for use in conjunction with all the other data utilized by the engine 15. The data may then be sent by the data management manager to the various data stores.

10 A further application service is a click stream capturing service 34. This keeps track of individuals clicks behaviour from various applications and again records this into data stores as required.

An on-line statistic capturing service 35 records the utilization of  
15 advertisements in the form of hit rate, show count and again passes this into an appropriate data store. This application may also handle statistic calculation request from retailers and marketers and return the calculation results to requestors.

The essence of the present invention is provided by the context sensitive  
20 advertisement service 36. It is this service that accepts input of context sensitive advertisements submitted by retailers or advertisement marketers. It may also accept recommendation requests from individual users such as mobile carriers and perform preliminary advertisement selections based on criteria set by retailers or marketers. The application may forward the recommendation request and selected

advertisements to the filter manager for further processing and return recommended context sensitive advertisements back to the mobile carrier.

The data management manager 30 receives the information and passes the information or retrieves information from a variety of data stores. The data stores are categorized by the nature of the information and are shown as a plurality of data stores in this embodiment. Of course, the data may be stored in a single data store and indexed appropriately or such other combination of data stores as a designer may desire.

The data stores include a location data store 40 that stores the location mapping information between mobile network sensors and country specific location names. This location data store assists in identifying the location of a particular user on the mobile network in a form suitable for identification by the overall engine 15.

This embodiment also provides an advertisement data store 41. This data store may contain the advertising information entered by retailers or marketers. In addition, the same data store may be used to store the advertisement utilization information being the historical data on use mentioned previously.

A weather condition data store 42 can contain the current, forecasted and historical weather conditions. This may include current, forecasted and historical conditions on rainfall, temperature, humidity and similar factors.

A user profile data store may contain the mobile users specific preferences in data store 43. Certain mobile users may have specific requirements or desires in terms of advertising material and this may also store the mobile users personal key information to allow the mobile user to update that information as required.

5

A further data store 44 may be provided to contain various system information utilized by the processor and manager systems 30 and 31.

A file system 45 is also provided to assist in the administration of the engine  
10 15 by storing the system level logging information.

The filter manager 31 is used to process the context sensitive advertising requests and return the recommendation list to the mobile user. The filter manager utilizes a variety of filters that are supplied with data from the data management  
15 manager 30 so that they may filter the advertisements to provide a recommendation list from the variety of information contained in the data store and pass to the filters by the data management manager.

The filters provide a plurality of filters 50 to 54 as shown. Of course, the  
20 number of filters provided are determined by the number of characteristics to which the advertisements may be filtered in their selection.

A first filter 50 may comprise the user preference filter. Upon receiving a request from a particular mobile user, the user profile data store may supply the  
25 preferences to the data manager and be passed to the preference filter 50 to

manipulate the recommendation list for advertisements in accordance with this data. Similarly, successive filters may be utilized to refine and change the recommendation list.

5       As shown in this embodiment, additional filters are provided by the location filter 51, weather condition filter 52 and the collaborative filter 53. The collaborative filter is supplied with historical data on usage to apply an implicit preference based on the usage by a particular set of users of a mobile carrier.

10       A variety of other filters 54 may be provided to further filter the recommendation lists on suitable criteria.

15       Generally, the filters 50 to 54 will update themselves with the current conditions from the data management manager when not processing a specific request. This can increase the processing speed as the filters do not need to obtain contemporaneous data but instead rely on data received immediately prior to the request.

20       A filtering script 60 is provided that contains the scripts for use by the filter manager 31 to control the workflow between recommendation filters for producing a recommendation.

25       This embodiment also includes an off-line scheduler 61 to accept schedules of off-line jobs from recommendation filters and ensure that the recommendation filters perform their off-line tasks as scheduled. For example, the weather condition filter 52

may require more regular updating than the location filter or collaborative filter. Hence the off-line scheduler 61 allows the filters to perform updating tasks when offline at suitable intervals for the type of filter involved.

5           A filter specific data store 62 is provided to retain the data from the filters upon update to remain available for on-line use.

In use, the engine 15 may operate in accordance with the general workflow shown in Fig. 4.

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A mobile user may initiate a request for recommendation of context sensitive information in the form of an advertisement for use on the mobile carrier. It is advertising as intended for use by the mobile carrier subscribers.

15           The request may be commenced by a login process into the application or by clicking on a link in a web page that the application may provide on the Internet.

The user request 1 may then be passed to the context sensitive advertisement service 36. This may redirect the request to an information management system being the data management manager 30. This may pass the request in step 3 to the filter manager 31 to compile the necessary recommendations. This request in step 3 includes the profile of the user from the data store 43 and the location of the end-user supplied by the mobile carrier.

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Upon receiving the request, the filter manager 31 co-ordinates the various filters 50 to 54 as shown in Fig. 3 to produce the recommendation list.

As an initial step 4, the filter manager may ask for suitable advertisements from the information or data management system 30. This may be returned in step 5 to the filter manager and this list of advertisements passed to the individual filters in step 6. The filters themselves may ask for filter specific data from the data store if required or alternatively the filters may be preloaded with the information and updated off-line. This filter specific data is returned to the filters in step 8. As a filter 10 50 considers the list of advertisements, it may rank the list of advertisements according to the characteristics of the individual filter and return these to the filter manager 31. This is shown in step 9 in Fig. 4. This may be a cyclic process such that the list of advertisements 6 and ranked list of advertisements 9 is forwarded and received by the filter manager 31 successfully through each of the filters in use in the system. The filter manager is able to control the use of the filters and even provide 15 some filters with precedence over others to bias according to that particular filter criteria.

Once a ranked list of advertisements has passed through all the filters and been 20 received by the filter manager 31, this finalized ranked list of advertisements can be passed in step 10 back to the data management system 30 and as a finalized list of recommendations to the context sensitive advertisement service 36. This may then be passed back in step 12 to the user to complete the process.



As it can be seen that this invention provides a method and an apparatus in which advertising material can be filtered into a recommended list of advertisements for a mobile user in accordance with a variety of criteria. These criteria include the mobile users own explicit preferences in terms of preferences on colours, brands and  
5 also on the demographics of the mobile user. Additionally, the advertisements may be filtered in accordance with occasion or environmental data such as weather to maximize the applicability of the advertisements to the viewer of those advertisements.

10 The invention provides a method and apparatus that also accommodates some virtual intelligence in the selection of advertising.

As explained previously, individual users activities over a span of time may be recorded in a suitable data store. This allows the apparatus to compile a virtual  
15 persona of the mobile user that is reflected in the filters used to select advertising for that user.

In addition to an individual's virtual persona, the apparatus and method may also accommodate the aggregation of a plurality of virtual personas to deduce or  
20 predict trends for the plurality of users. These trends may be used to compile a suitable filter to rank recommendations based on current trends. As it is used in a filter in conjunction with the individual user's virtual persona as reflected by the filters directed to the user's own explicit preferences or historical usage, the advertising is able to be selected to reflect both an individual's preferences as well as  
25 reflective trends compiled over a range of users.

Although this invention has been described with reference to a preferred embodiment, it will be appreciated that a variety of other embodiments may fall within the scope and spirit of the invention without departing from the scope as defined by the appended claims. Specific integers referred to throughout the  
5 description are deemed to incorporate known equivalence where appropriate.

CLAIMS

1. A method for selecting advertising for users of a mobile network having a plurality of users and at least one mobile carrier providing a communication path for said users comprising:
- 5
- providing at least one database of advertising for selection or recommendation;
  - receiving and storing preferences for advertising from said mobile user;
  - receiving information on at least said users location in said mobile network; and
  - selecting or recommending advertising from said database in accordance with said preferences of said mobile user and said user location.
- 10
- 15 2. A method as claimed in claim 1 wherein said method also stores historical usage data of the collective and/or individual users of said mobile carrier and further processes said selection or recommendation in accordance with said historical usage data.
- 20 3. A method as claimed in claim 1 wherein said method selects advertising for a plurality of mobile subscribers.
4. A method as claimed in claim 1 wherein said method further includes the step of receiving and storing variable environmental data that may affect network

users and further processing said selection or recommendation with reference to this environmental data.

5           5.     An apparatus for selecting advertising for users of a mobile network having a plurality of users and at least one mobile carrier carrying a communication path for said users comprising:

- a first database containing advertising for selection or recommendation;
- an explicit preference database to receive references for advertising  
10           from said mobile user;
- receiving means to receive a request for advertising selection or recommendation for a user together with information on said user location; and
- processing means to search said first database and compile selections  
15           or recommendations of advertising based on said explicit preferences and said user location.

20           6.     An apparatus for selecting advertising for users of a mobile network as claimed in claim 5 wherein said apparatus further includes an implicit preference database to contain and store historical usage data of the collective and/or individual use of the users of a mobile carrier and said processing means further processes said selection or recommendation with regard to this historical usage data.

7. An apparatus for selecting advertising for users of a mobile network as claimed in claim 5 wherein said apparatus further receives environmental data on current environmental conditions that may affect said user and further processes said selection or recommendation to reflect these current environmental conditions.

8. An apparatus for selecting advertising for users of a mobile network as claimed in claim 7 wherein said environmental data includes current and/or forecasted weather conditions.

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9. A method of providing context sensitive advertisements to mobile users over a network having a plurality of users and at least one mobile carrier comprising:

- receiving information on a user's location;
- receiving information on current environmental conditions;
- storing preferences specified by said mobile user; and
- interrogating a database of advertisements to provide a selection or recommendation based on said user's location, current environmental conditions and said mobile user's preferences.

15

20 10. A communication system capable of providing context sensitive advertisements to mobile users comprising:

- a network containing a plurality of users and at least one mobile carrier communicating with said users on said network;
- a database of advertisements for recommendation or selection and provision to said mobile users; and

25

- processing means to interrogate said database to select or recommend advertisements for provision to said user on the basis of said user's location in the network, current environmental conditions and preferences specified by said mobile user.

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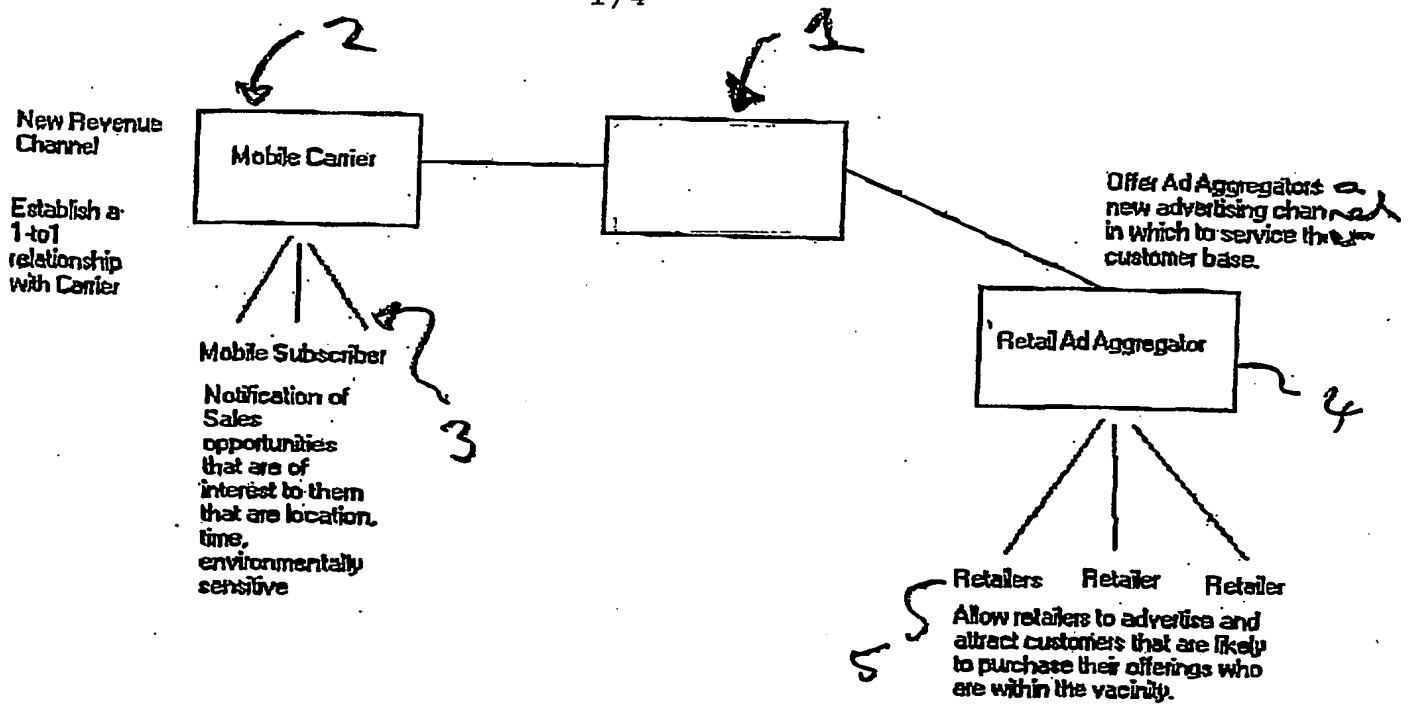
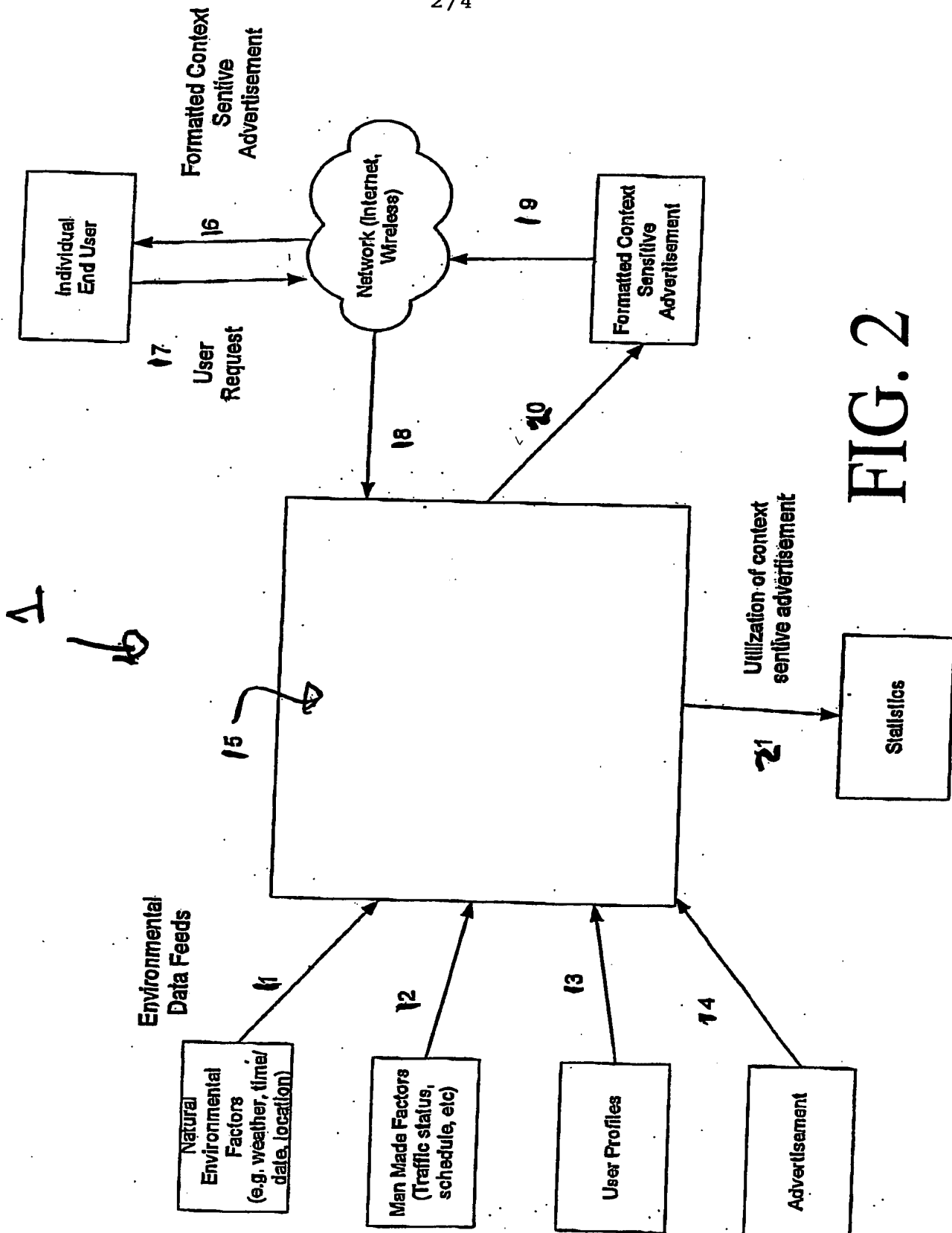


FIG. 1

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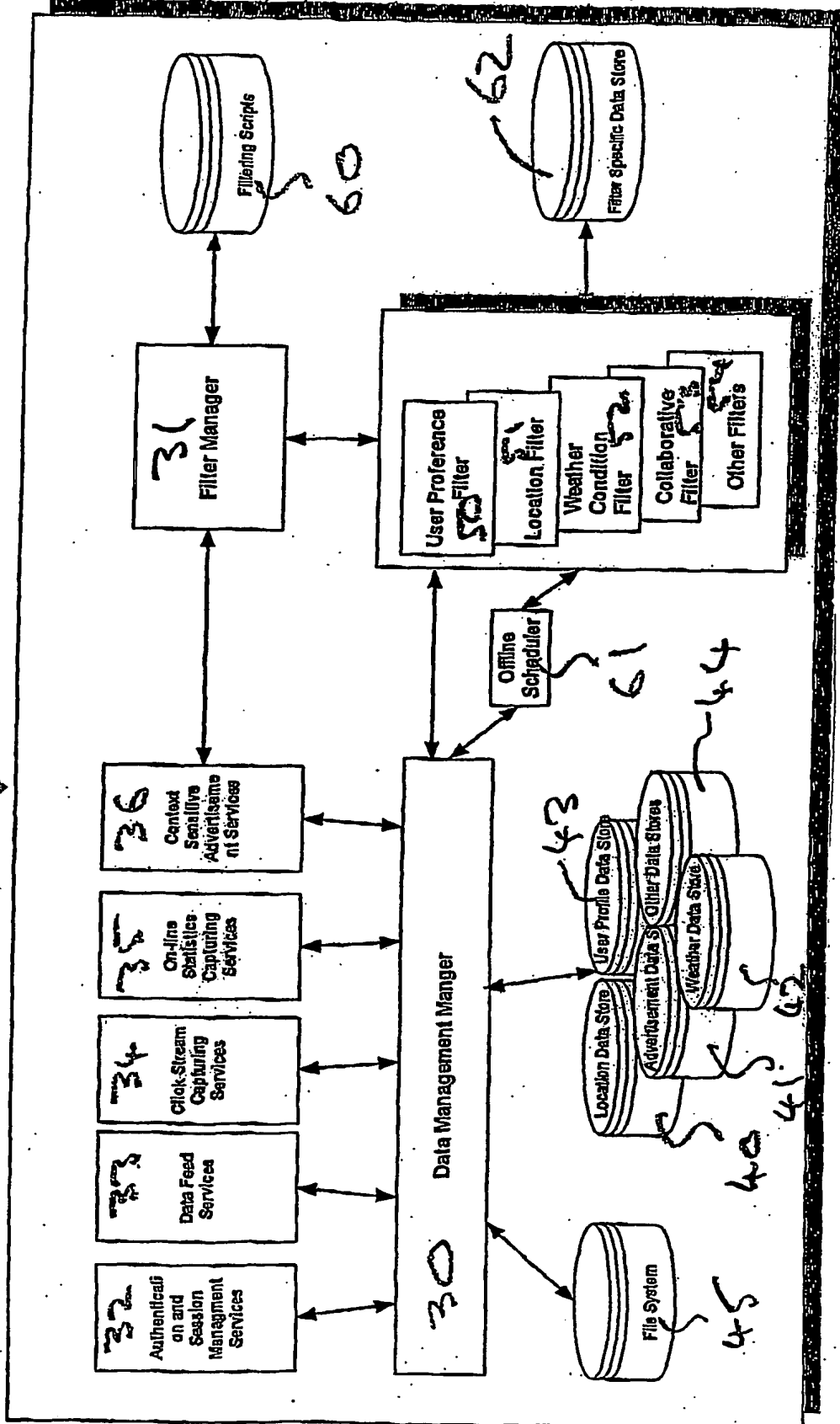


FIG. 3

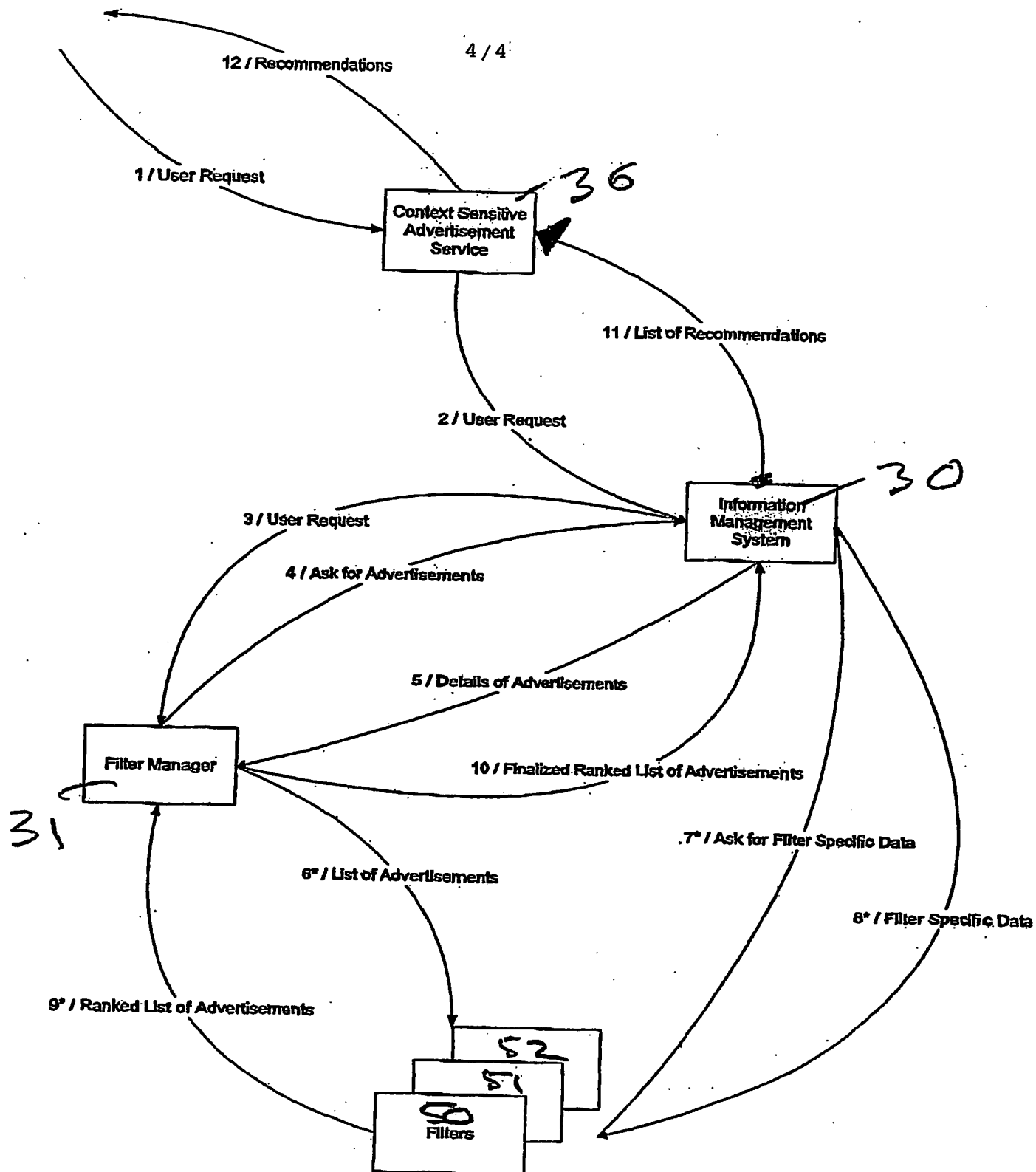


FIG. 4

Note : Step 6 to step 9 are performed once per filter. The ranked list of advertisements composed in a former filter is further refined by the later filters.